not be technically interpreted in some cases (for instance, gallbladder not identified, overlying gas or dressing precludes ultrasonography). In conclusion, HIDA scans can be recommended as the single test of choice in objectively documenting the presence of acute cholecystitis.

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Thallium 201 Myocardial Imaging in the Diagnosis of Coronary Artery Disease

THALLIUM 201 stress scintigraphy has now been widely accepted as an important clinical tool that substantially improves the accuracy in diagnosing noninvasively the presence, extent and severity of coronary artery disease. The ^{201}Tl tracer is administered during peak exercise. The immediate post-stress images reflect regional myocardial blood flow, whereas the delayed images—that is, recorded four hours later—reflect myocardial viability. A transient defect (one that resolves from the early to the late images) represents stress-induced ischemia, whereas a persistent defect usually represents myocardial scars. Because the ^{201}Tl distribution in myocardium reflects the pathophysiologic consequences of coronary stenosis on myocardial blood flow rather than on the coronary anatomy, the test provides functional information that is not available through routine coronary arteriography. Compared with electrocardiography (ECG), images obtained with the use of ^{201}Tl yield accurate information on location, extent and number of myocardial segments affected by ischemia as well as the presence of necrotic or scar tissue, information that is of considerable prognostic value in patients with ischemic heart disease.

The sensitivity (80%) and specificity (91%) of ^{201}Tl stress testing for detecting coronary artery disease are considerably higher than those of electrocardiographic stress testing (60% and 81%, respectively). An important consideration for the clinical use of ^{201}Tl stress scintigraphy is that the probability of coronary artery disease developing in a given person after the test largely depends on the pretest probability as determined by age, sex, symptoms and risk factors. Thallium 201 stress testing affects the probability of disease only little in patients with a high pretest probability. Routine diagnostic use of the test therefore does not appear justified in this particular patient population. By contrast, the test considerably alters the probability of coronary artery disease in patients with a moderate pretest probability. Accordingly, the exercise ^{201}Tl scan is clinically indicated in patients who have (1) typical chest pain but no resting or stress ECG abnormalities, (2) abnormal findings on stress ECG but no symptoms, (3) atypical chest pain and equivocal results of stress ECG and (4) known ischemic heart disease considered for surgical treatment in order to gain additional prognostic information before and after operation, and to assess the physiologic significance of a questionable coronary artery lesion seen on angiography. Other indications for ^{201}Tl stress scintigraphy are exercise-induced chest pain but normal or minimal lesions of coronary arteries. In these patients, an inappropriate vasoconstriction (coronary vasospasm) elicited by exercise may be responsible for the anginal symptoms. Thallium 201 may then be a useful tool for clarifying the underlying pathogenetic mechanism of ischemia.

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Detection of Skeletal Metastasis—A Rational Approach to the Use of Nuclear Bone Imaging and Radiography

SINCE THE ADVENT of technetium Tc 99m phosphate bone-seeking radiopharmaceuticals, the relative efficacy of scintigraphic bone scanning and x-ray skeletal survey has been extensively investigated. There is substantial agreement about the results and the clinical implications of several published studies, and it is important for practicing physicians to be aware of these findings so that they may apply them more efficiently and economically in practice.

Nuclear bone scanning is significantly more sensitive than x-ray studies in detecting metastatic bone lesions. In considering metastatic lesions of all origins, the nuclear scan will detect about 80% more lesions than radiography, whereas only about 2% of lesions seen radiographically will not be detected on the nuclear study. Most of the cases missed by nuclear bone scanning are due to specific conditions. Given the clearly superior sensitivity of nuclear bone scanning compared with radiology in the detection of metastasis, together with the fact that this procedure is less laborious and involves less radiation to patients, it is, in most instances, the method of choice in the screening of patients for metastatic bone disease. It has been shown that areas that are positive on bone scan frequently take from 6 to 18 months to be noted radiologically.

While a nuclear study is extremely sensitive, positive findings are often not specific enough to make a diagnosis of metastatic disease with certainty. It is there-